INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 1994	**Park:** Shenandoah NP
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Permit#:
SHEN1994AJKI

Park-assigned Study Id. #:
unknown

Project Title:
Occurence and Severity of Ozone Injury on Sensitive Hardwood Species in Selected Eastern National Park

Permit Start Date: Jan 01, 1998	**Permit Expiration Date** Jan 01, 1998
Study Start Date: Jan 01, 1991	**Study End Date** Jan 01, 1994

Study Status:
Completed

Activity Type:
Other

Subject/Discipline:
Air Quality

Objectives:

The objectives of this investigation were: a) to determine the occurrence and severity of foliar ozone symptoms on black cherry, yellow-poplar, and white ash at three Trend Plots in SHEN in Virginia in 1991, 1992, and 1993; b) to determine the relationship between observed foliar symptoms and ambient ozone exposures in SHEN; and c) to determine the relationship between ambient ozone exposures and corwn transparency, density, defoliation, percent live crown, crown class, and canopy position.

Findings and Status:

SUM60 and W126 ozone concentrations were consistently greatest in 1991 and least in 1992 at each of the three sites, and greatest at Big Meadows (the highest elevation site) and least at Sawmill Run (the lowest elevation site) during all three years. Comparisons of yearly results show that SUM0 ozone concentrations were greater in 1993 than in 1991 or 1992 at Dickey Ridge and Big Meadows, and W126 ozone concentrations were greatest in 1993 at Sawmill Run. Sawmill Run had greater SUM0 concentrations in 1991 and SUM80 concentrations in 1992 and 1993 than did Dickey Ridge.;Most black cherry and white ash were symptomatic at Big Meadows, the least injury was observed at Sawmill Run during all years of evaluation. In 1991, 1992, and 1993, the percent of symptomatic black cherry at Dickey Ridge was 40, 13, and 13%; at Big Meadows 87, 75, and 82%; at Sawmill Run 7, 10, and 0%. There were 63, 17, and 20% yellow-poplar symptomatic at Dickey Ridge in 1991, 1992, and 1993 respectively; 7 and 17% at Big Meadows in 1992 and 1993, respectively, and consistently 67% of yellow-poplar were symptomatic at Sawmill Run over all three years. At Dickey Ridge in 1991 and 1992 there were 43 and 27% symptomatic white ash, respectively; at Big Meadows, 63 and 40%, respectively; and at Sawmill Run in 1992, 37% were symptomatic. The best fit regression model describing the relationship between cumulative ozone exposures and foliar injury was exponential, with models for foliar injury vs SUM60 and W126 as the most significant.;The phenology study in 1992 also showed an exponential increase of foliar injury as cumulative ozone increased throughout the summer. The 1993 subplot study indicated that the most symptomatic trees (92%) occurred in sub-plots associated with the Big Meadows site, followed by those associated with the Dickey Ridge site (28%).

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?
No

Funding provided this reporting year by NPS:	**Funding provided this reporting year by other sources:**

55743	0
Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**
PENN STATE	6000